

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

COBBLESTONE WIRELESS, LLC,

*Plaintiff,*

V.

T-MOBILE USA, INC.,

*Defendant,*

NOKIA OF AMERICA CORPORATION  
and ERICSSON, INC.,

*Intervenors.*

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NO. 2:22-CV-00477-JRG-RSP

## CLAIM CONSTRUCTION ORDER

In three consolidated patent cases,<sup>1</sup> Plaintiff Cobblestone Wireless, LLC, alleges infringement of claims from U.S. Patent Nos. 8,891,347, 9,094,888, and 10,368,361 by T-Mobile USA, Inc., AT&T Corp. (and two affiliated companies), and Verizon Wireless. Nokia and Ericsson have intervened in each case. For simplicity, however, the Court refers collectively to the various defendants and intervenors as “Defendants.”

Each of the patents relates to wireless communications. The '347 Patent teaches using multiple propagation paths of a signal, such as those resulting from scattering, as a resource when they are normally considered detrimental. *See* '347 Patent at 3:31–37. The '888 Patent relates to handing off a wireless device from one network to another. '888 Patent at [54], [57]. And

<sup>1</sup> The member cases are No. 2:22-CV-00474-JRG-RSP and No. 2:22-CV-00478-JRG-RSP.

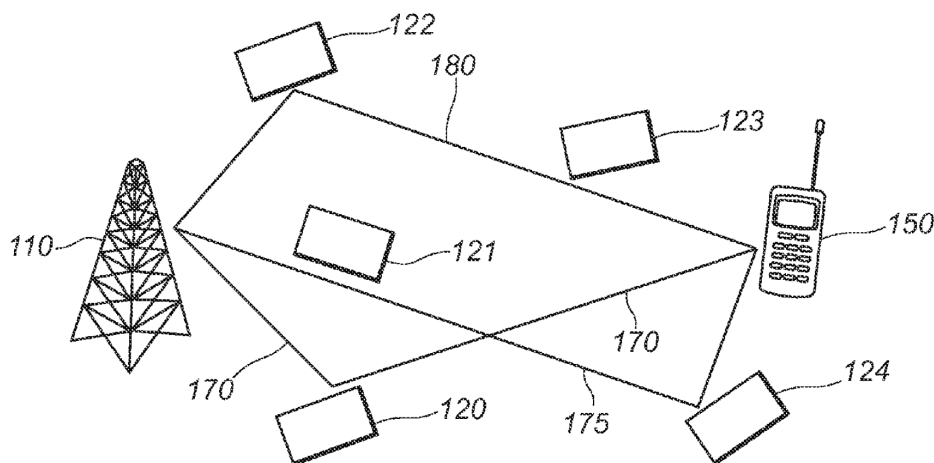
the '361 Patent teaches how to better use available frequencies within a communication system. *See generally* '361 Patent at 3:29–55 (explaining how prior-art networks might underuse available frequency spectrum resources when traffic loads change).

The parties present six disputes concerning the patents. Having considered the parties' briefing and arguments of counsel during a May 2, 2024 hearing, the Court resolves the disputes as follows.

## I. BACKGROUND

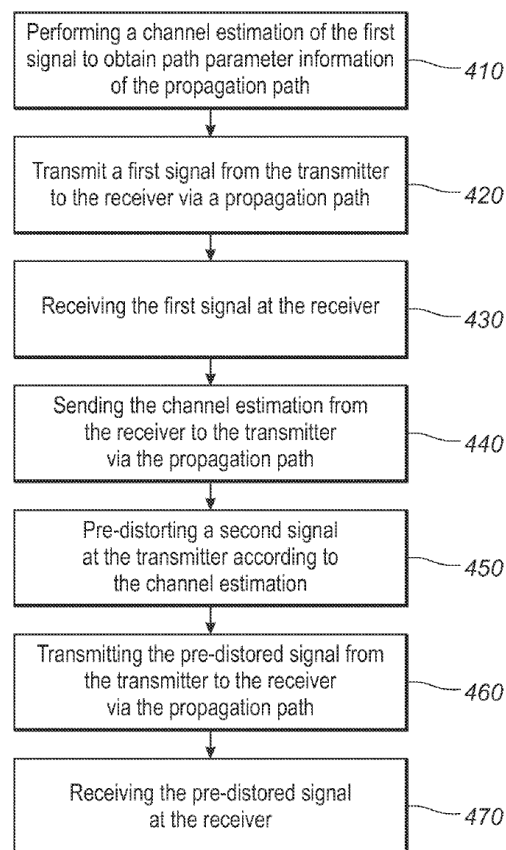
### A. U.S. Patent 8,891,347

As shown in Figure 1 (below), environmental factors like buildings 120–124 may cause scattering of a signal into multiple propagation paths 170, 175, 180. '347 Patent at 3:20–30. Although multiple propagation paths are usually disfavored, the '347 Patent shows how to use those paths as a resource. Even though the multiple paths have different characteristics, the method teaches modulating a signal so the signals over the different paths can be combined by the receiver, such that the paths are analogous to multiple wired connections between two points. *Id.* at 3:38–54.



**FIG. 1 of the '347 Patent**

Figure 4 (below) shows the steps of the only disclosed embodiment of the method. In steps 410, 420, and 430, the method requires a “channel estimation” of a signal to obtain “path parameter information of the propagation paths 170, 175, 180.” ’347 Patent at 8:4–16. After receiving the transmitted signal along the various paths, the receiver executes a channel estimation algorithm to estimate the delay, Doppler frequency, direction of arrival, direction of departure, and complex amplitude. *Id.* In step 440, the mobile devices send these parameters to the base station. In step 450, the transmitter pre-distorts a signal based on the received parameters to compensate for the multiple propagation paths.



**FIG. 4 of the '347 Patent**

The patent includes independent method, system, and apparatus claims generally directed

to the steps shown in Figure 4. Claim 1, for example, recites the method as:

1. A method for wireless communication in a system including a transmitter, a receiver, and a plurality of propagation paths formed between the transmitter and the receiver which are capable of carrying a signal transmitted by the transmitter to the receiver, the method comprising:
  - transmitting a first signal from the transmitter to the receiver via a first propagation path of the plurality of propagation paths;
  - receiving the first signal at the receiver;
  - performing a channel estimation based on the first signal to obtain path parameter information of the first propagation path;
  - sending the channel estimation that includes the path parameter information from the receiver to the transmitter via the first propagation path;
  - predistorting a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal;
  - transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path; and
  - receiving the predistorted second signal at the receiver.

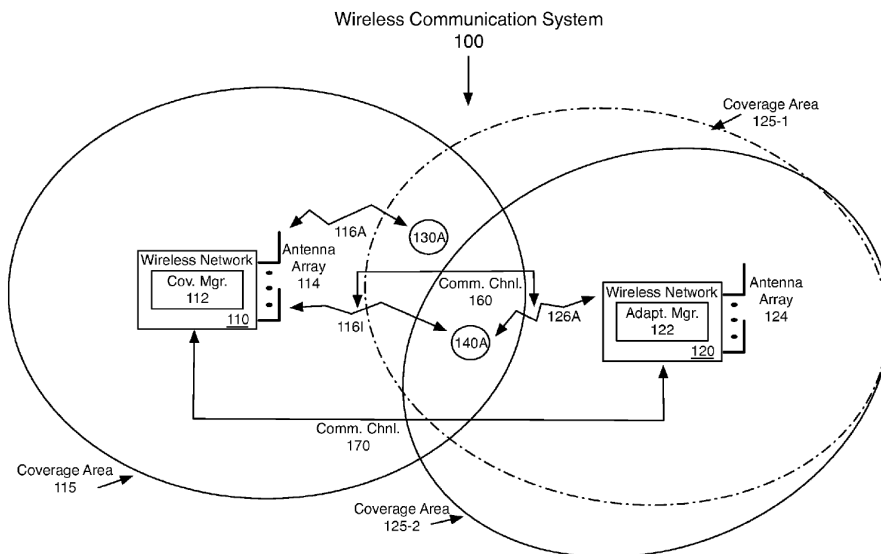
'347 Patent at 16:40–61. Claim 8 recites a receiver and transmitter that are configured to perform these same steps. *See id.* at 17:32–51. Similarly, Claim 15 recites a base station with a computer-readable medium storing instructions for performing the transmitter side of Figure 4's steps. *See id.* at 18:26–47.

The parties have one dispute from these claims. Referring to Claim 1, Defendants contend the “channel estimation” *sent* in the fourth limitation is the same “channel estimation” *performed* in the third limitation. Thus, conclude Defendants, the sent “channel estimation” is the algorithm used in the third limitation rather than the result of performing that algorithm, as Plain-

tiff urges. The same dispute arises from the language of Claims 8 and 15.

## B. U.S. Patent 9,094,888

The '888 Patent teaches a method of handing off a wireless device from one network to another. '888 Patent at [54], [57]. The patent explains that, as sectors of coverage within a wireless network change, a particular device might no longer be detected after that change, even if it stays in the same place. *Id.* at 1:28–34. For example, Figure 1A (below) shows a shifting coverage area 125-1, 125-2 of a second wireless network 120 that once included device 130A but now does not. Instead, the first network 110 covers the device, despite that the second network 120 might be the best coverage option under some circumstances. *See id.* at 6:6–17 (noting the device might receive a stronger signal from the second wireless network or the first wireless network might be overburdened and need to reduce the number of connected devices). Based on coverage information provided by the device 130A, the first network 110 might handoff the device 130A to the second network, which would provide coverage using beamforming.



**FIG. 1 of the '888 Patent**

For purposes of claim construction, Claim 9 is exemplary. That method claim recites:

9. A method implemented at a first wireless network for a mobile wireless device handoff between a second wireless network and the first wireless network, the method comprising:

receiving a handoff request from the second wireless network, the handoff request based, at least in part, on a determination by the second wireless network that the wireless device is not currently covered by the first wireless network but is capable of being covered by the first wireless network;

based, at least in part, on the handoff request, adapting one or more beams of an antenna array to facilitate coverage of the wireless device by the first wireless network; and

transmitting a confirmation from the first wireless network to the second wireless network to indicate acceptance of the handoff request, wherein the wireless device is handed off from the second wireless network to the first wireless network.

'888 Patent at 18:30–48. The disputed terms are in Claim 12, which limits the “adapting” step of Claim 9, and Claim 20, which recites an “adaption manager” that performs similar steps to those recited in Claim 9. Specifically, the parties dispute whether the “adaption manager” is governed by 35 U.S.C. § 112 ¶ 6.

### **C. U.S. Patent 10,368,361**

The '361 Patent explains “bursty and asymmetric wireless traffic” generally inhibits efficient use of the available spectrum. '361 Patent at 3:29–35. Specifically, because the transmission strength of a node is significantly higher than the signals it receives, transmission may interfere with simultaneously receiving signals when the downlink and uplink frequencies are too close. To solve this problem, the prior art separates the uplink and downlink channels, which might result in unused parts of the available spectrum between them. *See generally id.* at 3:29–55.

To address this waste of resources, the patent teaches assigning frequencies to one of three pools—either an “uplink resource pool,” a “downlink resource pool,” or a “shared resource pool.” ’361 Patent at [57]. Assignment is based on what the patent calls “quality status,” which, in the described embodiments, relates to metrics such as channel quality indicators (CQIs), received interference power (RIP), frequency of acknowledgments (or no acknowledgments) to data packets, error rates, signal-to-noise ratios, or combinations of these. *Id.* at 4:26–34.

Claim 10, which includes all of the disputed terms from this patent, recites:

10. A wireless base station for a wireless communication network, the wireless base station comprising:
  - a quality status module configured to determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the wireless base station for an uplink channel or a downlink channel;
  - a processor coupled to the quality status module and configured to:
    - determine, based on the quality status of the first frequency spectrum resource, that the first frequency spectrum resource is a sub-optimal resource, for the uplink channel and the downlink channel, relative to other frequency spectrum resources that are available for use by the wireless base station; and
    - in response to the determination that the first frequency spectrum resource is the *sub-optimal resource*, assign the first frequency spectrum resource to a *shared resource pool*; and
  - a scheduler module coupled to the processor and configured to:
    - schedule the second frequency spectrum resource for the uplink channel or the downlink channel based on an initial directional allocation of frequency spectrum re-

sources for the wireless base station;  
 determine an updated directional allocation of frequency spectrum resources for the wireless base station after the second frequency spectrum resource is scheduled for the uplink channel or the downlink channel; and  
 schedule the first frequency spectrum resource based on the updated directional allocation of frequency spectrum resources for the wireless base station.

'361 Patent at 18:52–19:20. The parties dispute whether “quality status module” invokes 35 U.S.C. § 112(f), the scope of “shared resource pool,” and whether “sub-optimal resource” is definite.

## II. GENERAL LEGAL STANDARDS

### A. Generally

“[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g., Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007) (Gajarsa, J., concurring in part); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996), *aff'g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc).

Claim construction, however, “is not an obligatory exercise in redundancy.” *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, “[c]laim construction is a matter of (resolving) disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims . . .” *Id.* A court need not “repeat or restate every claim term in order to comply with the ruling that claim construction is for the court.” *Id.*

When construing claims, “[t]here is a heavy presumption that claim terms are to be given

their ordinary and customary meaning.” *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore “look to the words of the claims themselves . . . to define the scope of the patented invention.” *Id.* (citations omitted). The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1313. This “person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1312). For certain claim terms, “the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Phillips*, 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (“We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history.”). But for claim terms with less-apparent meanings, courts consider “those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean . . . [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Phillips*, 415 F.3d at 1314.

## B. Means-Plus-Function Claiming<sup>2</sup>

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112 ¶ 6 (pre-AIA); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). Under 35 U.S.C. § 112 ¶ 6, a structure may be claimed as a “means . . . for performing a specified function,” and an act may be claimed as a “step for performing a specified function.” *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002). When it applies, § 112 ¶ 6 limits the scope of the functional term “to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof.” *Williamson*, 792 F.3d at 1347.

But § 112 ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112 ¶ 6 applies when the claim language includes “means” or “step for” terms, and a rebuttable presumption it does *not* apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. These presumptions stand or fall according to whether one of ordinary skill in the art would understand the claim with the functional language to denote sufficiently definite structure or acts for performing the function in the context of the entire specification. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (noting § 112 ¶ 6 does not apply when “the claim language, read in light of the specification, recites sufficiently definite structure” (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Masco Corp.*, 303 F.3d at 1326 (noting § 112 ¶ 6 does not apply when the claim in-

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<sup>2</sup> Two of the patents at issue have an effective filing date before the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 285-93 (2011). For simplicity, the Court will refer to the pre-AIA version of the statute in this section.

cludes an “act” corresponding to “how the function is performed”); *Personalized Media Commc’ns, LLC v. I.T.C.*, 161 F.3d 696, 704 (Fed. Cir. 1998) (noting § 112 ¶ 6 does not apply when the claim includes “sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term ‘means.’” (quotation marks and citation omitted)).

Construing a means-plus-function limitation involves multiple steps. “The first step . . . is a determination of the function of the means-plus-function limitation.” *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). “The next step is to determine the corresponding structure described in the specification and equivalents thereof.” *Id.* “Structure disclosed in the specification is corresponding structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* The corresponding structure “must include all structure that actually performs the recited function.” *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). But § 112 does not permit “incorporation of structure from the written description beyond that necessary to perform the claimed function.” *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

“[S]tructure can be recited in various ways, including [by using] ‘a claim term with a structural definition that is either provided in the specification or generally known in the art,’ or a description of the claim limitation’s operation and ‘how the function is achieved in the context of the invention.’” *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1366 (Fed. Cir. 2022) (quoting *Apple, Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1299 (Fed. Cir. 2005)). For § 112, ¶ 6 limitations implemented by a programmed general-purpose computer or microprocessor, the corresponding structure described in the patent specification must usually include an algorithm for performing

the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). In that case, the corresponding structure is not a general-purpose computer but rather the special-purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

### **C. Indefiniteness**

“[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). The claims “must be precise enough to afford clear notice of what is claimed” while recognizing that “some modicum of uncertainty” is inherent due to the limitations of language. *Id.* at 908.

“Indefiniteness must be proven by clear and convincing evidence.” *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017). And in the context of § 112 ¶ 6, “[t]he party alleging that the specification fails to disclose sufficient corresponding structure must make that showing by clear and convincing evidence.” *TecSec, Inc. v. IBM*, 731 F.3d 1336, 1349 (Fed. Cir. 2013) (quoting *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1380–81 (Fed. Cir. 2001)).

### **III. THE LEVEL OF ORDINARY SKILL IN THE ART**

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, “(a) person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.” *KSR*

*Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Here, the parties address the level of ordinary skill through their respective experts' declarations. Plaintiff's expert opines a skilled artisan would have had "a bachelor's degree in electrical engineering, computer engineering, computer science, physics, or the equivalent and 2–3 years of work experience with digital wireless communication, cellular communications and networking, radio-access network architectures and/or protocols, service provisioning, signal propagation in wireless networks, or the equivalent." Cooklev Decl., Dkt. No. 108-1 ¶ 20. Defendants' expert uses generally the same characterization. *See* Proctor Decl., Dkt. No. 110-1 ¶ 19 (concluding a skilled artisan would have had "at least a bachelor's degree in electrical engineering, computer engineering, computer science, physics, or the equivalent, and at least two years of experience working in the field"). The Court adopts Plaintiff's characterization due to the bounded nature of the required amount of experience, but views these levels of skill as generally the same. Importantly, neither party suggests resolving the present disputes requires resolving the differences between their proposed levels of skill.

#### IV. THE DISPUTED TERMS

##### A. "the channel estimation [that includes the]/[including] path parameter information" ('347 Patent, Claims 1, 8, 15)

Plaintiff's Position	Defendants' Position
The "channel estimation" referenced in the limitation is the result of the channel estimation performed in the preceding step.	No construction necessary; plain and ordinary meaning

This dispute centers on the third and fourth limitations of Claim 1, which recite:

performing a *channel estimation* based on the first signal to obtain  
path parameter information of the first propagation path; [and]  
sending the *channel estimation* that includes the path parameter in-

formation from the receiver to the transmitter via the first propagation path[.]

'347 Patent at 16:49–54 (emphasis added). The parties dispute what it means to “send[] the channel estimation.”

According to Defendants, “sending *the* channel estimation” in the fourth limitation refers to the same “channel estimation” performed in the third limitation. Thus, reason Defendants, “sending the channel estimation” requires sending the algorithm used to calculate the path parameter information because “performing a channel estimation” requires using an algorithm. Dkt. No. 110 at 2–4. Sending the algorithm “allow[s] the base station to better understand how the path parameter information was calculated” because, as the patent explains, parameter accuracy depends on the algorithm used. *Id.* at 4 (quoting Proctor Decl., Dkt. No. 110-1 ¶ 26, and '347 Patent at 8:17–47).

Plaintiff asserts Defendants’ construction contradicts the plain meaning of the term in light of the specification. More specifically, Plaintiff accuses Defendants’ expert of “a misguided legalistic reading” that leads to a “nonsensical” result. Dkt. No. 108 at 4. Pointing to *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367 (Fed. Cir. 2008), Plaintiff challenges Defendants’ assumption “that the antecedent relationship between two terms absolutely requires a uniform meaning.” *Id.* Moreover, says Plaintiff, Defendants’ approach morphs “channel information that includes the path parameter information” into “(1) the channel estimation (or algorithm) *and* (2) the path parameter information.” Dkt. No. 112 at 1.

Plaintiff has the better position. As Plaintiff notes, reading “the channel information” as an “algorithm” renders the subsequent language “that includes the path parameter information” nonsensical, as a skilled artisan would not consider an algorithm to include *the result of using* the

algorithm. Moreover, in the only disclosed embodiment of the method, the specification describes “sending the channel estimation” only as feeding back path parameter information to the transmitter. ’347 Patent at Fig.4 (step 440), 9:1–3.

Although courts generally presume a term should be given the same meaning throughout the claims, the intrinsic record can overcome that presumption. *See Fin Control Sys. Pty, Ltd. v. OAM, Inc.*, 265 F.3d 1311, 1318 (Fed Cir. 2001) (“the presumption [is] that the same terms appearing in different portions of the claims should be given the same meaning unless it is clear from the specification and prosecution history that the terms have different meanings at different portions of the claims”). Here, a skilled artisan would understand from the context of the surrounding claim language that the “channel estimation” being sent in the fourth limitation is the *result* of the “channel estimation” performed in the third limitation. Accordingly, the Court construes:

- “sending the channel estimation” in Claim 1 as “sending the result of the channel estimation”;
- “send the channel estimation” in Claim 8 as “send the result of the channel estimation”;
- “receive a channel estimation” in Claim 15 as “receive a result of a channel estimation”; and
- “according to the channel estimation” in Claims 1, 8, and 15 as “according to the result of the channel estimation.”

**B. “adaption manager” (’888 Patent, Claim 20)**

Plaintiff’s Position	Defendants’ Position
<p>No construction necessary; plain and ordinary meaning; not subject to 35 U.S.C. § 112 ¶ 6.</p> <p>Alternatively, if subject to 35 U.S.C. § 112 ¶ 6:</p> <p><b>Function:</b> receive a handoff request from the second wireless network, the handoff request based, at least in part, on a determination by the second wireless network that the wireless device is capable of being covered by the first wireless network; cause a beam from among the one or more adaptable beams to be adapted in order to enable the wireless device to be covered by the first wireless network; transmit a confirmation to the second wireless network to indicate acceptance of the handoff request, wherein the wireless device is handed off from the second wireless network to the first wireless network</p> <p><b>Structure:</b> adaption manager 122 (FIGS. 1A–1C, 3, 5–7, 4:4–6, 5:18–20, 6:18–7:23, 8:65–10:13, 12:23–13:28, 13:62–15:45), and/or corresponding figures and equivalents</p>	<p>Indefinite under 35 U.S.C. § 112 ¶ 6</p>

Claim 20 recites:

20. A system for a wireless device handoff between a first wireless network and a second wireless network, the system comprising:

an antenna array configured to generate one or more adaptable beams to modify a coverage area for the first wireless network; and

an adaption manager having logic, the logic configured to:

receive a handoff request from the second wireless network, the handoff request based, at least in part, on a determination by the second wireless network that the wireless device is capable of being covered by the first

wireless network,  
 cause a beam from among the one or more adaptable beams  
 to be adapted in order to enable the wireless device to  
 be covered by the first wireless network, and  
 transmit a confirmation to the second wireless network to  
 indicate acceptance of the handoff request, wherein the  
 wireless device is handed off from the second wireless  
 network to the first wireless network.

'888 Patent at 19:59–20:10.

The parties dispute whether “adaption manager” is a means-plus-function term and, if it is, whether there is sufficient corresponding structure to avoid an indefiniteness holding. Plaintiff stresses the lack of the word “means” and the presumption that attaches as a result. Dkt. No. 108 at 8. It also argues the claim as a whole provides the requisite guidance to a person of ordinary skill. *Id.* at 9. Defendants respond a skilled artisan would not have understood “adaption manager” to connote sufficiently definite structure, and the only disclosure of an “adaption manager” in the specification shows “an undefined, functional box.” Dkt. No. 110 at 8–9. Defendants appear to agree with Plaintiff’s identification of the claimed function. *See id.* at 8 (calling the “adaption manager” “a generic, functional term intending to recite a ‘means’ for performing three specific functions”).

As for whether this is a means-plus-function term, the Court agrees with Defendants. Plaintiff does not dispute that “adaption manager” does not have a known meaning to a skilled artisan. And although Plaintiff correctly notes the surrounding claim language may be enough to avoid means-plus-function treatment, the mere recitation of inputs and outputs does not necessarily connote “sufficiently definite structure.” *See Williamson*, 792 F.3d at 1351 (noting that, while the claim described inputs and outputs at a high level, “the claim does not describe how the

‘distributed learning control module’ interacts with other components . . . in a way that might inform the structural character of the limitation-in-question or otherwise impart structure”). Here, while the claim recites that the “adaption manager” has logic that “receives,” “causes a beam to be adapted,” and “transmits,” the limitation does not recite a relationship to the antenna array in a way that connotes sufficiently definite structure. *See Egenera, Inc. v. Cisco Sys.*, 972 F.3d 1367, 1374 (Fed. Cir. 2020) (“The question is not whether a claim term recites *any* structure but whether it recites *sufficient* structure . . . .”). Accordingly, the Court holds this term invokes 35 U.S.C. § 112 ¶ 6.

As for whether the specification clearly links corresponding structure to the recited function, the Court agrees with Plaintiff. Figure 3, which is the only disclosed embodiment of a so-called “adaption manager,” reflects memory 230, I/O interfaces 240, optional applications 350, and control logic 350. With respect to that figure, the specification explains:

[A]dapt logic 310 and control logic 320 may separately or collectively represent a wide variety of logic device(s) to implement the features of adaption manager 122. An example logic device may include one or more of a computer, a microprocessor, a microcontroller, a field programmable gate array (FPGA), an application specific integrated circuit (ASIC), a sequestered thread or a core of a multi-core/multi-threaded microprocessor or a combination thereof.

’888 Patent at 9:20–28.

Regarding corresponding structure, “[w]here there are multiple claimed functions . . . , the patentee must disclose adequate corresponding structure to perform all of the claim functions.” *Williamson*, 792 F.3d at 1351–52. Here, two of the recited functions are simply transmitting and receiving information to and from another network. Thus, to the extent corresponding structure might be required for those functions, they can be found in the adaption manager’s control logic 220 and input/output interfaces 240. *See In re Katz*, 639 F.3d 1303, 1316 n.1 (Fed. Cir.

2011) (holding the disclosure of a general-purpose computer may be sufficient corresponding structure for functions like “processing,” “receiving,” and “storing”).

So can the structure for “causing a beam . . . .” At most, the “adaption logic” must command or instruct the antenna array to adapt a beam, and that beam must cover the wireless device. But the antenna array, not the adaption manager, generates the beam. And the recited function says nothing about calculating or determining the extent of that coverage area. As such, this function does not require any complex algorithm, and the structure of the “adaption manager” disclosed by the specification suffices. Accordingly, the Court construes “adaption manager” as “the adaption manager 122 shown in Figures 1A–1C, 3, and 5, and described at ’888 Patent at 5:18–20, 6:18–7:23, 8:65–10:13, 12:23–13:28, and 12:62–15:45, and equivalents.”

**C. “predetermined network load” (’888 Patent, Claim 12)**

Plaintiff’s Position	Defendants’ Position
No construction necessary; plain and ordinary meaning; not subject to 35 U.S.C. § 112.	Indefinite.

Claim 9 recites a method “for a mobile wireless device handoff” comprising the step of “adapting one or more beams of an antenna array to facilitate coverage of the wireless device by the first wireless network.” ’888 Patent at 18:41–43. Claim 12 then further limits that “adapting” step to “adapting one or more beams based, at least in part, on . . . a predetermined network load placed on the first wireless network device.” *Id.* at 18:62–65.

Defendants challenge “predetermined network load” as indefinite because a skilled artisan “would not understand how adapting the beam based on a predetermined network load due to the handoff could be determined before the handoff.” Dkt. No. 110 at 16 (quoting Proctor Decl., Dkt. No. 110-1 ¶ 56). They stress the patent’s disclosures do not explain the scope of the term in

the context of beam adaption. *Id.* at 17.

But according to Plaintiff, Defendants’ expert’s declaration shows the claim scope is clear. Dkt. No. 108 at 17. In fact, Plaintiff agrees with Dr. Proctor’s understanding that the determination must be performed before the handover, but suggests Defendants’ arguments are more appropriate for a sufficiency-of-disclosure challenge, such as lack of enablement or written description. *Id.* at 17–19.

The Court agrees with Plaintiff. The parties do not dispute the scope of the term, or even the scope of the longer phrase in which it appears. Questions of how to make and use the invention, as Defendants ask here, go more towards enablement than claim construction. Accordingly, because there is no dispute about claim scope, the Court rejects Defendants’ indefiniteness challenge and will give this a “plain and ordinary meaning” construction.

**D. “quality status module configured to determine a respective status of a first frequency spectrum resource and a second spectrum resource” (’361 Patent, Claim 10)**

Plaintiff’s Position	Defendants’ Position
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<p>No construction necessary; plain and ordinary meaning; not subject to means-plus-function treatment under 35 U.S.C. § 112(f).</p> <p>If § 112(f) applies:</p> <p><b>Function:</b> determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the wireless base station for an up-link channel or a downlink channel</p> <p><b>Structure:</b> Processor with software running an algorithm to execute measurement of “channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), and equivalents.</p>	<p>Means-plus-function term governed by § 112(f).</p> <p><b>Function:</b> determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the wireless base station for an up-link channel or a downlink channel</p> <p><b>Structure:</b> Processor with software running an algorithm to execute measurement of “channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), etc.” ’361 Patent at 4:29–34.</p>
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The parties only dispute whether this is a means-plus-function term. If it is, they agree on the claimed function and, for the most part, the corresponding structure.

Asserting this is not a means-plus-function term, Plaintiff points to the “full context” of Claim 10, which requires the recited processor to be coupled to the “quality status module.” Dkt. No. 108 at 20. It also points to allegedly inherent inputs and outputs based on the specification’s description of providing the “quality status” to the processor and receiving “quality status” information from the node. *Id.* at 21. Finally, it suggests Defendants’ failure to assert the recited “scheduler module” is a means-plus-function term “counsels against” holding this is a means-plus-function term. *Id.* at 22.

Defendants counter that a skilled artisan would not understand “quality status module” to have any structural meaning. In their view, Plaintiff relies on only “high level disclosures,” which “are not enough to turn a nonce term into *sufficient* structure.” Dkt. No. 110 at 20.

Here, as with “adaption manager,” Plaintiff at most shows the module is coupled to the recited processor and that it has inputs and outputs. Nothing about the claim’s language shows how to “determine a respective quality status.” And tellingly, neither Plaintiff nor its expert proffers an explanation of what the structure actually is. Accordingly, the Court holds this is a means-plus-function term.

As for corresponding structure, the Court adopts Plaintiff’s proposal given the vagueness of “etc.” at the end of Defendants’ construction. Specifically, the Court holds the corresponding structure is a “processor with software running an algorithm to execute measurement of ‘channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR),’and equivalents.”

**E. “shared resource pool” (’361 Patent, Claims 10, 11, 17)**

Plaintiff’s Position	Defendants’ Position
Plain and ordinary meaning, which is “a pool containing one or more frequency spectrum resources that can be scheduled for uplink or downlink channels”	“a pool containing one or more sub-optimal frequency spectrum resources that can be scheduled for uplink and downlink channels”

Generally, the ’361 Patent teaches assigning frequency spectrum resources into one of “a downlink resource pool, an uplink resource pool, or a shared resource pool” based on suitability of each resource for the uplink or downlink pools. ’361 Patent at [57]. The claims more specifi-

cally recite computer-executable instructions for assigning a frequency spectrum resource to a “shared resource pool” in response to determining that the resource is sub-optimal. *See id.* at 19:3–6 (reciting, in Claim 10, a processor configured to, “in response to [a] determination that [a] first frequency spectrum resource is [a] sub-optimal resource [relative to other resources], assign the first frequency spectrum resource to a shared resource pool”); *see id.* at 20:37–40 (reciting the same language in Claim 17 as “computer-executable instructions”).

At the hearing, Defendants focused on two disputes concerning “shared resource pool,” which in the disclosed embodiments is part of memory. *See* ’361 Patent Fig.1 (items 115–118). First, Defendants questioned whether the resources assigned into the “shared resource pool” must be sub-optimal resources or whether they can be *any* resource. Hr’g Tr., Dkt. No. 123 at 5:18–21. Second, Defendants question whether resources in the “shared resource pool” must be available for both uplink and downlink use. *Id.* at 5:21–24.

Starting with the second dispute, the parties agree the “shared resource pool” contains resources that must be available for both uplink *and* downlink purposes. *See* Hr’g Tr., Dkt. No. 123 at 24:2–5 (noting Plaintiff’s agreement with Defendants’ position). They also agree the claims do not require *simultaneous* use of pool resources for both uplink and downlink transmission. *See id.* at 21:20–22 (“[Defendants] agree that . . . the resources in the shared pool don’t have to be actually used for both at the same time”). Although the Court opts to use “or” rather than “and” in its construction, that does not mean the “shared resource pool” might contain resources that are limited to use only for downlink transmission or only for uplink transmission. That would eviscerate the notion of the resources being “shared” with the uplink and downlink resource pools as needed.

Concerning the first dispute, Defendants argue their construction should be adopted “[t]o

avoid an erroneous and misleading argument to the jury that *all resources* are in the ‘shared resource pool’ *by default*.” Dkt. No. 110 at 24. But the claims require a processor configured to make an *assignment* of a resource in response to determining that resource is “sub-optimal.” Thus, in what pool the resources start or their designation as “sub-optimal” does not bear on whether the processor is configured to make the required assignment. As Defendants note, “What’s key here is you’ve got to have an assignment to go into this pool.” Hr’g Tr., Dkt. No. 123 at 14:24–25; *see also id.* at 15:20–21 (“the key here is the shared resource pool is populated by assignment”). Plaintiff agrees. *See id.* at 123:10–12 (“What is claimed is that we do have to at some point . . . be putting resources into this shared pool because they are sub-optimal”).

But the contents of the “shared resource pool” at any time, or how those contents got there, don’t speak to whether the required assignment was made. For example, the open-ended nature of Claim 10 does not preclude instructions for assigning a resource to the “shared resource pool” for reasons *other than* sub-optimality. Accordingly, it would be improper to require the “shared resource pool” to contain a suboptimal resource at all times. The Court therefore rejects the “sub-optimal” language of Defendants’ construction and construes “shared resource pool” as “a pool containing one or more frequency spectrum resources that can be scheduled for either uplink or downlink channels.”

**F. “sub-optimal resource” (’361 Patent, Claims 10, 17)**

Plaintiff’s Position	Defendants’ Position
No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112.	Indefinite

Defendants assert “sub-optimal” is a term of degree for which the patent provides no objective boundaries. Thus, different skilled artisans with the same information might differ as to

whether a resource is “suboptimal.” Dkt. No. 110 at 26. Moreover, say Defendants, the specification’s teaching that any number of metrics or combinations of metrics can be used to determine sub-optimality compounds the problem. *See id.* at 27–28 (citing *Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372 (Fed. Cir. 2018), and *Berkheimer v. HP Inc.*, 881 F.3d 1360 (Fed. Cir. 2018)).

According to Plaintiff, however, the claims and written description provide “ample guidance” as to what the term means. Dkt. No. 108 at 26. In particular, “[t]he ‘sub-optimal resource’ determination” must (1) be based on “the quality status determined by the quality status module”; (2) “relate to both uplink and downlink channels”; (3) “be relative to other frequency spectrum resources”; and (4) “the subsequent assignment of the first resource to a shared resource pool must be in response to the determination.” *Id.* at 26–27. Plaintiff points to one example suggesting “sub-optimal” simply means less than other resources’ quality statuses. *Id.* at 27 (citing ’361 Patent at 11:18–28).

Defendants have not shown this term is indefinite. Regarding their position that “sub-optimal” is a term of degree without objective boundaries provided by the specification, Defendants’ position would be more persuasive if the limitation in which “sub-optimal” appears did not also include the modifying phrase “relative to the other frequency spectrum resources.” Considered with that modifying phrase, the term simply means “less than optimal” compared to the other resources. *How much less* is not important to determining infringement.

As for Defendants’ argument that using different metrics or combinations of metrics might result in different determinations of “optimality,” that relates more to the meaning of “quality status,” which the parties did not brief. Regardless, this argument amounts to a challenge under *Ball Metal Bev. Container Corp. v. Crown Packaging Tech., Inc.*, 838 Fed. App’x 538

(Fed. Cir. 2020), and similar cases. In *Ball Metal*, the Federal Circuit explained

a claim may be invalid as indefinite when (1) different known methods exist for calculating a claimed parameter, (2) nothing in the record suggests using one method in particular, and (3) application of the different methods result in materially different outcomes for the claim’s scope such that a product or method may infringe the claim under one method but not infringe when employing another method.

*Ball Metal*, 838 Fed. App’x at 542. While non-precedential, *Ball Metal* concisely summarizes applicable law about when a claim requiring a measurement or calculation may be indefinite. *See Takeda Pharm. Co. v. Zydus Pharm. USA, Inc.*, 743 F.3d 1359, 1366–67 (Fed. Cir. 2014) (noting “the mere possibility of different results from different measurement techniques” is not enough to render a claim indefinite).

Here, Defendants have not satisfied their clear-and-convincing burden with respect to at least the third part of *Ball Metal*’s test—that application of different calculations might result in an infringement determination under one calculation but not another. At most, Defendants show a choice of which combination of metrics to use, but the Court questions whether the choice of metrics ultimately results in different conclusions regarding infringement. For example, Defendants do not provide evidence showing the use of “bit error rate” leads to a different conclusion on suboptimality than using signal-to-interference-noise (SINR) ratio. Given the nature of those and the other metrics, it is not unreasonable to think they are related such that they lead to the same conclusions on infringement. After all, a low SINR could be the reason for a higher “bit rate error.”

Regarding Defendants’ reliance on *Intellectual Ventures*, the relevant claim recited “allocating means for allocating resources to said IP flow . . . so as to *optimize end user application IP QoS requirements* of said software application.” *Intellectual Ventures*, 902 F.3d at 1376. The pa-

tent itself likened QoS to “a continuum, defined by what network performance characteristic is most important to a particular user” and characterized it as “a relative term, finding different meanings for different users.” *Id.* at 1381 (quoting U.S. Patent 6,640,248 at 12:51–52, 62–65). According to the patent at issue, “the end-user experience is the final arbiter of QoS.” *Id.* (quoting ’248 Patent at 14:39–40).

Here, however, Defendants point to no such statements from the patent, nor anything else that suggests the determination of what resource is “sub-optimal” is based on “the end-user experience.” Rather, “quality status” is an objective measurement. *See, e.g.*, ’361 Patent at 9:3–5 (explaining the node sorts available resources “based on the quality status *measured* for each” (emphasis added)); *id.* at 12:4–7 (using the CQI value as the quality status); *id.* at 11:60–61 (referring to “quality status” meeting or exceeding a particular threshold).

*Berkheimer* is also distinguishable. Considering the phrase “archive exhibits minimal archive redundancy,” the court noted the specification’s use of inconsistent terminology to describe the amount of redundancy. *Berkheimer*, 881 F.3d at 1363–64. Ultimately, the court concluded “[t]he specification contain[ed] no point of comparison for skilled artisans to determine an objective boundary of ‘minimal’ when the archive includes *some* redundancies.” *Id.* at 1364. And in the prosecution history, the applicant “explained that the claim ‘desires to eliminate redundancy’ but includes the word ‘minimal’ because ‘to eliminate all redundancy in the field of the claimed invention is not likely.’ . . . This does not explain how much redundancy is permitted.” *Id.* Here, however, the converse is true: A skilled artisan need only determine that a frequency resource is not optimal relative to the other frequencies against which it is compared. It doesn’t matter how much “less optimal” the resource is.

No doubt the choice to use “sub-optimal” in claim language could often lead to an indefi-

niteneess holding. On this record, however, the claims nonetheless “inform, with reasonable certainty, those skilled in the art about the scope of the invention,” *Nautilus, Inc.*, 572 U.S. at 901, and Defendants have not shown the claim is indefinite by clear-and-convincing language. Given that, the Court will give this term a “plain and ordinary meaning” construction.

## V. CONCLUSION

Disputed Term	The Court’s Construction
“sending the channel estimation” (’347 Patent, Claim 1)	“sending the result of the channel estimation”
“send the channel estimation” (’347 Patent, Claim 8)	“send the result of the channel estimation”
“receive a channel estimation” (’347 Patent, Claim 15)	“receive a result of a channel estimation”
“according to the channel estimation” (’347 Patent, Claims 1, 8, 15)	“according to the result of the channel estimation”
“adaption manager” (’888 Patent, Claim 20)	<p>Governed by 35 U.S.C. § 112¶ 6.</p> <p><b>Function:</b> receive a handoff request from the second wireless network, the handoff request based, at least in part, on a determination by the second wireless network that the wireless device is capable of being covered by the first wireless network; cause a beam from among the one or more adaptable beams to be adapted in order to enable the wireless device to be covered by the first wireless network; transmit a confirmation to the second wireless network to indicate acceptance of the handoff request, wherein the wireless device is handed off from the second wireless device is handed off to the first wireless network</p> <p><b>Structure:</b> adaption manager 122 (FIGS. 1A–1C, 3, 5, 5:18–20, 6:18–7:23, 8:65–10:13, 12:23–13:28, 13:62–15:45) and equivalents</p>

Disputed Term	The Court's Construction
“predetermined network load” (’888 Patent, Claim 12)	Plain and ordinary meaning
“quality status module configured to determine a respective status of a first frequency spectrum resource and a second spectrum resource” (’361 Patent, Claim 10)	<p>Governed by 35 U.S.C. § 112(f).</p> <p><b>Function:</b> determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the wireless base station for an uplink channel or a downlink channel</p> <p><b>Structure:</b> Processor with software running an algorithm to execute measurement of “channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR),” and equivalents.</p>
“shared resource pool” (’361 Patent, Claims 10, 11, 17)	“a pool containing one or more frequency spectrum resources that can be scheduled for either uplink or downlink channels”
“sub-optimal resource” (’361 Patent, Claims 10, 17)	Plain and ordinary meaning

The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party’s claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court’s reasoning in this opinion. Any reference to claim construction

proceedings is limited to informing the jury of the positions adopted by the Court.

**SIGNED this 29th day of May, 2024.**

  
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ROY S. PAYNE  
UNITED STATES MAGISTRATE JUDGE